Translated by

Checked by

Typed by (12)

TRANSLATION

from

ROTHA FULLFORD LEOPOLD

BCM BOX 6575
LONDON WC1N 3XX
ENGLAND

P.O. BOX 7
WODEN, A.C.T.
AUSTRALIA 2606

JAPANESE PATENT SPECIFICATION

No. 48-61665 (1973)

PROCESS FOR PRODUCTION OF GRANULAR MALTITOL

Filing date: December 3, 1971, No. 46-97655 (Examination requested)

Specification published: unexamined: August 29, 1973

Inventor(s): K. Kawakita

~~Assignee:~~

PATENT CLAIM

A process for production of granular maltitol, comprising the step of holding maltitol syrup or pulverulent maltitol or mixture of these at a moisture content of 2-15% by weight, optionally with kneading of said maltitol, and forming said maltitol into soft granules with a noncompressive, disintegrative, centrifugal granulator.

FULL DISCLOSURE OF THE INVENTION

This invention relates to a process for the production of granular maltitol which is simple and produces granular maltitol of superior solubility and softness and which is free from a tendency to agglomerate inside containers.

Maltitol is prepared by hydrogen reduction of maltose. Maltitol can be used as a sweetener but has the disadvantage that finely powdered maltitol is not free-flowing and, when added to water, floats and dissolves with difficulty. Further, when left in containers for long periods it absorbs moisture and readily cakes and agglomerates.

The object of the invention is to overcome these shortcomings by producing granules with the aid of a convenient, simple process, and in particular to inexpensively provide maltitol which does not agglomerate or cake and has improved softness and solubility.

Maltitol is very soluble in water. Aqueous solutions obtained by the hydrogen reduction of maltose can be concentrated by evaporation at less than 110° to the degree of residual moisture required to reduce this invention to practice.

For pulverulent maltitol, the opposite procedure is required and the appropriate quantity of a saturated aqueous solution of maltitol should be added. When using a mixture of the powder and the maltitol aqueous solution, the kneading process is carried out after the addition of the aqueous solution or the application of a concentration treatment so as to achieve a water content of 2-15 weight %.

Nutrients such as vitamins can be added as required during kneading, and with longer kneading times coating

and microencapsulation can also be carried out. In order to prevent agglomeration, a caking inhibitor may be added during the kneading. To facilitate the granulation, a binder such as a soluble starch may be used.

With water contents of less than 2% no soft granules can be expected. When the water content exceeds 15%, not only a mud separates which is difficult to granulate, but the granules cannot be used without prior drying treatment.

As soft granules cannot readily be produced with a compression extruder, noncompressive methods are preferred, such as disintegrative centrifugal methods, transfer or transmission methods, especially with a Tornado mill, a Fitz mill or Speed mill. (All three name spellings uncertain. Translator.) For the purposes of the invention, the ideal granulator is a fixed cylindrical screen within which are torsional vanes that rotate at high speed, applying a shear force to the moistened material and disintegrating it. The particles formed are expelled by centrifugal force through the mesh of the cylindrical screen.

In accordance with the invention maltitol granules are produced by a continuous process comprising kneading maltitol powder and an aqueous solution of maltitol with a total water content in the range of 2-15 wt. %, followed by a noncompressive granulation such as disintegrative centrifugal granulation. [This paragraph appears to be

inconsistent with the patent claim which does not require kneading but offers it as an option. Translator.]

As the granular maltitol formed is free-flowing and non-aggregating, the sugar alcohol can be packed for sale. During the processing the granules can be additionally treated, e.g. coated, if required.

The following table shows a comparison between the process of the invention and compressive type extrusion forming method.

	This Invention (Disintegrative centrifugation)	Prior Art (Extrusion molding)
Solubility	good	poor
Apparent density	low	high
Porosity ratio	high	low
Granulation time	low	long

No soft granules are formed by extrusion forming methods which involve high pressure application and large water contents. Also, in these methods the mechanical friction of the treatment is considerable. By comparison, the process of the invention not only produces soft granules through granulation by a disintegrative centrifugal method but also is a substantially water-free process. The mechanical phase of the treatment is relatively minor and power costs therefore are only one-fifth those incurred in the extrusion forming process.

On account of its specific surface area, the novel product of this invention has improved solubility. When used as a sweetener, it can be made to dissolve almost instantly. The sweetener has the advantages that it is soft and does not agglomerate, it does not deteriorate when stored for long periods and it remains free-flowing.

Example 1

An aqueous maltitol solution was initially concentrated to a water content of 5% and in this state was kneaded in a kneader, transferred to a disintegrative centrifugal granulator, dried, and the finished product recovered. The granular maltitol had a particle size of about 80 mesh and was highly soluble and soft.

Example 2

To pulverulent maltitol (about 200 mesh) prepared by spray drying was added an aqueous solution of starch to give a composition containing 2% starch granules and having a water content of 5-7 wt. %. The mixture was kneaded in a kneader and transferred directly to a disintegrative centrifugal granulator. The granular maltitol product passing through the cylindrical screen had a particle size of about 50 mesh, was soft and free-flowing.

Example 3

To 35 parts of pulverulent maltitol was added 10 parts of a concentrated maltitol solution (25% water, 75% maltitol as solids), dried to a water content of about 7 wt. %, and transferred to a kneader. The mixture was passed through a disintegrative centrifugal granulator having a cylindrical screen, and dried. The granular maltitol so recovered had a large particle size of 30 mesh and was of exceptionally good solubility.

(The above is a substantially complete translation.)